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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,854	11/19/2001	John Teloh	SMQ-082CN2/P6396CNT1	9383
959	7590	10/22/2003	EXAMINER	
LAHIVE & COCKFIELD 28 STATE STREET BOSTON, MA 02109			ABEL JALIL, NEVEEN	
			ART UNIT	PAPER NUMBER
			2175	3
DATE MAILED: 10/22/2003				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/988,854

Applicant(s)

TELOH ET AL.

Examiner

Neveen Abel-Jalil

Art Unit

2175

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/19/2001
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-24 and 26-30 is/are rejected.
- 7) ☒ Claim(s) 7, 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 9-11, 13-14, 16-24, and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Dziodosz et al. (U.S. Patent No. 5,832,222).

As to claim 1, Dziodosz et al. discloses in a storage network, a method to update a first replica held by a physically remote storage device in said storage network (See column 6, lines 10-48), said method comprising the steps of:

instructing a first data replication facility of a first electronic device in said storage network to log one or more writes to a local storage device when said first replica held by said physically remote storage device cannot be updated due to a detected error condition in the storage network (See column 5, lines 55-67, also see column 6, lines 3-17);

determining at said first electronic device if said detected error condition still exists in the storage network that prevents updating of said first replica held by said physically remote storage device (See column 6, lines 35-48);

instructing said first data replication facility of said first electronic device to replicate data corresponding to the one or more writes identified in said log to generate a second replica upon determination by said first electronic device that said first replica held by said physically

Art Unit: 2175

remote storage device can be updated due to a removal of said detected error condition that prevents updating of said first replica held by said physically remote storage device (See column 9, lines 6-42, wherein "removal of said detected error condition" reads on "before resuming operation", also see column 11, lines 48-58); and

outputting said second replica in accordance with a communication protocol from said first electronic device to a second data replication facility of a second electronic device of said physically remote storage device in said storage network to update said first replica (See column 6, lines 10-48, also see column 9, lines 42-60).

As to claim 2, Dziadosz et al. discloses comprising the step of, identifying to said first data replication facility of said first electronic device which of said one or more writes to said local storage device should not be logged when said physically remote storage device cannot be updated (See column 13, lines 1-21).

As to claim 3, Dziadosz et al. discloses comprising the step of, instructing said first data replication facility of said first electronic device to automatically output said second replica to said second replication facility once generation of said second replica is complete (See column 6, lines 49-57).

As to claim 4, Dziadosz et al. discloses comprising the step of, instructing said first replication facility of said first electronic device to prompt an operator of said first replication facility in order to obtain authorization for said output of said second data replica to said second

Art Unit: 2175

data replication facility of said second electronic device to update said first replica (See column 14, lines 43-67).

As to claim 5, Dziadosz et al. discloses comprising the steps of,
instructing said first replication facility of said first electronic device to halt logging of said one or more writes to said local storage device upon said determination that said first replica can be updated (See column 9, lines 15-42, wherein “halt logging” reads on “before proceeding”, also see column 10, lines 50-62); and

instructing said first replication facility of said first electronic device to initiate generation of said second replica upon said determination that said first replica can be updated (See column 6, lines 2-25).

As to claim 9, Dziadosz et al. discloses wherein said outputting from said first data replication facility of said first electronic device to said second data replication facility of said second electronic device occurs in a synchronous manner (See column 7, lines 1-19).

As to claim 10, Dziadosz et al. discloses wherein said communication protocol comprises the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite (See column 8, lines 8-30).

As to claim 11, Dziadosz et al. discloses wherein said first electronic device and said second electronic device operate without a volume manager facility (See column 9, lines 1-5,

Art Unit: 2175

also see column 15, lines 24-39).

As to claim 13, Dziadosz et al. discloses in a computer network having a plurality of programmable electronic devices, wherein each of said plurality of programmable electronic devices operates as a host device for a data replication facility for replicating data among said plurality of programmable electronic devices (See column 10, lines 30-35), a method to handle a communication link failure in said computer network, said method comprising the steps of,

instructing each said data replication facility of each of said plurality of programmable electronic devices to enter a logging routine should said host device of said data replication facility detect said communication link failure (See column 7, lines 1-50),

wherein said logging routine halts said replicating of data by said replication facility of said host device and said replication facility of said host device identifies in a log each local write of said host device that detects said communication link failure (See column 9, lines 61-67, and see column 10, lines 1-29); and

instructing each said data replication facility of each of said plurality of programmable electronic devices that initiated said logging routine to generate a replica for each said local write identified in said log upon reestablishment of said communication link (See column 10, lines 38-62, also see column 9, lines 15-42).

As to claim 14, Dziadosz et al. discloses comprising the steps of, grouping each said replica into a single data set; and forwarding said single data set in accordance with a communication protocol from a first of said plurality of programmable electronic devices to a

Art Unit: 2175

second of said plurality of programmable electronic devices (See claims 8-10 language).

As to claim 16, Dziadosz et al. discloses wherein said first of said plurality of programmable electronic devices forwards said single data set in a synchronous manner (See column 7, lines 1-19).

As to claim 17, Dziadosz et al. discloses wherein said communication protocol comprises the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite (See column 8, lines 8-30).

As to claim 18, Dziadosz et al. discloses wherein each of said plurality of programmable electronic devices in said computer network operate without a volume manager facility (See column 9, lines 1-5, also see column 15, lines 24-39).

As to claim 19, Dziadosz et al. discloses a readable medium holding programmable electronic device readable instructions to perform a method in a storage network to update a first replica held by a physically remote storage device in said storage network (See column 2, lines 18-45), said method comprising the steps of:

instructing a first data replication facility of a first programmable electronic device in said storage network to enter a first state to log, one or more writes to a local storage device when said first replica held by said physically remote storage device cannot be updated due to a

Art Unit: 2175

detected error condition that does not allow transmission of data to said physically remote storage device (See column 5, lines 55-67, also see column 6, lines 3-17);

determining at said first programmable electronic device if said first replica held by said physically remote storage device can be updated due an abatement of the detected error condition (See column 6, lines 35-48);

instructing said first data replication facility of said first programmable electronic device to replicate data corresponding to the one or more writes identified in said log in order to create a second replica upon determination by said first programmable electronic device that said first replica held by said physically remote storage device can be updated (See column 9, lines 6-42, wherein "removal of said detected error condition" reads on "before resuming operation", also see column 11, lines 48-58); and

outputting said second replica in accordance with a communication protocol from said first programmable electronic device to a second data replication facility of a second programmable electronic device in communication with said physically remote storage device in said storage network to update said first replica (See column 6, lines 10-48, also see column 9, lines 42-60).

As to claim 20, Dziadosz et al. discloses comprising the step of, identifying to said first data replication facility of said first programmable electronic device which of said one or more writes to said local storage device should not be logged when said physically remote storage device cannot be updated (See column 13, lines 1-21).

As to claim 21, Dziadosz et al. discloses comprising the step of, instructing said first data replication facility of said first programmable electronic device to automatically transmit said second replica to said second replication facility once creation of said second replica is complete (See column 6, lines 49-57).

As to claim 22, Dziadosz et al. discloses comprising the step of, at said first replication facility of said first programmable electronic device, prompting an operator of said first replication facility to obtain permission for said outputting of said second data replica to said second data replication facility of said second programmable electronic device to update said first replica (See column 14, lines 43-67).

As to claim 23, Dziadosz et al. discloses comprising the steps of, instructing said first replication facility of said first programmable electronic device to exit said first state upon said determination that said first replica can be updated (See column 9, lines 15-42, also see column 10, lines 50-62); and

instructing said first replication facility of said first programmable electronic device to enter a second state to initiate creation of said second replica upon said determination that said first replica can be updated (See column 6, lines 2-25).

As to claim 24, Dziadosz et al. discloses comprising the steps of, detecting a communication link failure in said storage network between said first programmable electronic device and said second programmable electronic device; and

instructing said second replication facility of said second programmable electronic device to enter said first state to log one or more writes to a second local storage device coupled to said second programmable electronic device.

As to claim 27, Dziadosz et al. discloses wherein said outputting from said first data replication facility of said first programmable electronic device to said second data replication facility of said second programmable electronic device occurs in a synchronous manner (See column 7, lines 1-19).

As to claim 28, Dziadosz et al. discloses wherein said communication protocol comprises the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite (See column 8, lines 8-30).

As to claim 29, Dziadosz et al. discloses wherein said first programmable electronic device and said second programmable electronic device operate without a volume manager facility (See column 9, lines 1-5, also see column 15, lines 24-39).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 6, 8, 12, 15, 26, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dziadosz et al. (U.S. Patent No. 5,832,222) in view of Carter et al. (U.S. Patent No. 5,909,540).

As to claim 6, Dziadosz et al. does not teach comprising the step of, instructing said second replication facility of said second electronic device to log said one or more writes to a second local storage device of said second electronic device.

Carter et al. teaches comprising the step of, instructing said second replication facility of said second electronic device to log said one or more writes to a second local storage device of said second electronic device (See column 16, lines 19-38).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dziadosz et al. to include comprising the step of, instructing said second replication facility of said second electronic device to log said one or more writes to a second local storage device of said second electronic device.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dziadosz et al. by the teaching of Carter et al. to include comprising the step of, instructing said second replication facility of said second electronic device to log said one or more writes to a second local storage device of said second electronic device because identifying the physical storage location on the of the replica provides for efficient network database management.

Art Unit: 2175

As to claim 8, Dziadosz et al. does not teach comprising the step of, forwarding from said first data replication facility of said first electronic device to said second data replication facility at said second electronic device information identifying a storage location on said physically remote storage device for storage of said second replica.

Carter et al. teaches comprising the step of, forwarding from said first data replication facility of said first electronic device to said second data replication facility at said second electronic device information identifying a storage location on said physically remote storage device for storage of said second replica (See column 16, lines 19-38).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dziadosz et al. to include comprising the step of, forwarding from said first data replication facility of said first electronic device to said second data replication facility at said second electronic device information identifying a storage location on said physically remote storage device for storage of said second replica.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dziadosz et al. by the teaching of Carter et al. to include comprising the step of, forwarding from said first data replication facility of said first electronic device to said second data replication facility at said second electronic device information identifying a storage location on said physically remote storage device for storage of said second replica.

As to claim 12, Dziadosz et al. does not teach wherein said log comprises a bitmap holding one or more bits, wherein each of the one or more bits in the bit map indicates a storage location written to on the local storage device.

Art Unit: 2175

Carter et al. teaches wherein said log comprises a bitmap holding one or more bits, wherein each of the one or more bits in the bit map indicates a storage location written to on the local storage device (See column 31, lines 10-29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dziadosz et al. to include wherein said log comprises a bitmap holding one or more bits, wherein each of the one or more bits in the bit map indicates a storage location written to on the local storage device.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dziadosz et al. by the teaching of Carter et al. to include wherein said log comprises a bitmap holding one or more bits, wherein each of the one or more bits in the bit map indicates a storage location written to on the local storage device because bitmap is a well known and efficient method in the database art log and present resource mapping for storage and update purposes.

As to claim 15, Dziadosz et al. does not teach comprising the step of, packaging with said single data set information identifying a storage location for storage of said single data set on a storage device of said second of said plurality of programmable electronic devices.

Carter et al. teaches comprising the step of, packaging with said single data set information identifying a storage location for storage of said single data set on a storage device of said second of said plurality of programmable electronic devices (See column 16, lines 19-38).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dziadosz et al. to include comprising the step of,

Art Unit: 2175

packaging with said single data set information identifying a storage location for storage of said single data set on a storage device of said second of said plurality of programmable electronic devices.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dziadosz et al. by the teaching of Carter et al. to include comprising the step of, packaging with said single data set information identifying a storage location for storage of said single data set on a storage device of said second of said plurality of programmable electronic devices because identifying the physical storage location on the of the replica provides for efficient network database management.

As to claim 26, Dziadosz et al. does not teach comprising the step of, forwarding from said first data replication facility of said first programmable electronic device to said second data replication facility at said second programmable electronic device information identifying a storage location on said physically remote storage device for storage of said second replica.

Carter et al. teaches comprising the step of, forwarding from said first data replication facility of said first programmable electronic device to said second data replication facility at said second programmable electronic device information identifying a storage location on said physically remote storage device for storage of said second replica (See column 16, lines 19-38).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dziadosz et al. to include comprising the step of, forwarding from said first data replication facility of said first programmable electronic device to said second data replication facility at said second programmable electronic device information

Art Unit: 2175

identifying a storage location on said physically remote storage device for storage of said second replica.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dziadosz et al. by the teaching of Carter et al. to include comprising the step of, forwarding from said first data replication facility of said first programmable electronic device to said second data replication facility at said second programmable electronic device information identifying a storage location on said physically remote storage device for storage of said second replica because identifying the physical storage location on the of the replica provides for efficient network database management.

As to claim 30, Dziadosz et al. does not teach wherein said log comprises a bitmap to hold one or more pointers, wherein each of the one or more pointers indicate a location on a storage device written to during said first state.

Carter et al. teaches wherein said log comprises a bitmap to hold one or more pointers, wherein each of the one or more pointers indicate a location on a storage device written to during said first state (See column 30, lines 4-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dziadosz et al. to include wherein said log comprises a bitmap to hold one or more pointers, wherein each of the one or more pointers indicate a location on a storage device written to during said first state.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dziadosz et al. by the teaching of Carter et al. to include wherein

Art Unit: 2175

said log comprises a bitmap to hold one or more pointers, wherein each of the one or more pointers indicate a location on a storage device written to during said first state because installing a directory system having a pointer is a well known and efficient method in the database art log and present resource mapping for storage and update purposes.

Allowable Subject Matter

5. Claims 7 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record (Dziadosz et al. -U.S. Patent No. 5,832,222, and Carter et al. -U.S. Patent No. 5,909,540) do not disclose, teach, or suggest the claimed limitations of (in combination with all other features in the claim), detecting an available communication link in said storage network between said first electronic device and said second electronic device to transport data between said first electronic device and said second electronic device; prompting said system operator to select a primary replication facility and a secondary replication facility from amongst said first replication facility of said first electronic device and said second replication facility of said second electronic device; upon selection by said system operator, instructing said primary replication facility to generate said second replica of data identified in said log; and instructing said primary replication facility to output said second replica for

Art Unit: 2175

transmission to said secondary replication facility via said available communication link to update said first replica, as claimed in claims 7 and 25.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hacherl (U.S. Patent No. 6,324,571 B1) teaches floating single master operation.

Garnache et al. (U.S. Patent No. 6,401,120 B1) teaches method for consistent cluster operational data in a server cluster using a quorum pf replica.

Lisiecki et al. (U.S. Pub. No. 2002/0147774 A1) teaches content storage replication.

Wang et al. (U.S. Patent No. 6,587,970 B1) teaches method for performing site rollover.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neveen Abel-Jalil whose telephone number is 703-305-8114.

The examiner can normally be reached on 8:00AM-4: 30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici can be reached on 703-305-3830. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Neveen Abel-Jalil

Application/Control Number: 09/988,854

Art Unit: 2175

October 6, 2003

Page 17

Charles Rones

**CHARLES RONES
PRIMARY EXAMINER**